

# JOURNAL OF LOW TEMPERATURE PHYSICS—Volume 38, 1980

The *Journal of Low Temperature Physics* is an international medium for the publication of original papers on fundamental theoretical and experimental research in low temperature physics. Typical subject areas are:

Properties of Fermi and Bose systems, especially in the condensed phases, and of the hydrogen and helium isotopes;

Superfluidity and the properties of quantum fluids and solids;

Properties of isotopic mixtures at low temperatures;

Superconductivity;

Phase transitions at low temperatures;

Thermal properties, thermodynamics, and statistical mechanics of low temperature phenomena;

Lattice dynamics, phonon phenomena, acoustic, mechanical, and optical properties of substances at low temperatures;

Electronic properties of metals, semiconductors, and alloys including Fermi surfaces, oscillatory phenomena, magnetoelectrical effects, acoustic properties, and transport phenomena at low temperatures;

Magnetism at low temperatures including paramagnetic, ferromagnetic, and antiferromagnetic properties and including the behavior of dilute alloys and nuclear spin systems;

Surface phenomena at low temperatures.

Occasionally review articles will be included. No papers of a technical or applied nature will be accepted.

**O-EDITORS:** John G. Daunt and John P. Harrison  
Physics Department, Queen's University  
Kingston, Ontario, Canada K7L 3N6

## EDITORIAL BOARD AND POLICY COMMITTEE:

E. Alekseevski (USSR)	W. E. Keller (USA)	V. Peshkov (USSR)
L. Andronikashvili (USSR)	I. Khalatnikov (USSR)	R. S. Safrata (Czechoslovakia)
Bewilogua (GDR)	W.-Y. Kuan (China)	E. J. Saur (West Germany)
F. Brewer (UK)	C. G. Kuper (Israel)	A. Schmid (USA)
Clarke (USA)	I. M. Lifshitz (USSR)	T. Sugawara (Japan)
Doniach (USA)	O. V. Lounasmaa (Finland)	L. Tewordt (West Germany)
S. Dugdale (UK)	K. Maki (USA)	M. Tinkham (USA)
J. Emery (USA)	L. H. Nosanow (USA)	R. Tournier (France)
L. Fetter (USA)	J. L. Olsen (Switzerland)	J. C. Wheatley (USA)
N. Hardy (Canada)	R. L. Orbach (USA)	
C. Hohenberg (USA)	W. B. Pearson (Canada)	

Published monthly at Winterstoke Road, Bristol 3, England, by Plenum Publishing Corporation, 227 West 17th Street, New York, N.Y. 10011. In 1980, Volumes 38, 39, 40, and 41 (6 issues each) will be published. Subscription orders should be addressed to the publisher. *Journal of Low Temperature Physics* is abstracted or indexed in Applied Mechanics Reviews, Chemical Abstracts, Chemical Titles, Current Contents, Energy Research Abstracts, Engineering Index, INSPEC—Electrical and Electronics Abstracts and Physics Abstracts, Metals Abstracts Index, Referativnyi Zhurnal, Science Citation Index, Science Research Abstracts—Part A, and Solid State Abstracts Journal. © 1980 Plenum Publishing Corporation. *Journal of Low Temperature Physics* participates in the program of Copyright Clearance Center, Inc. The appearance of a code line at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use. However, this consent is given on the condition that the copier pay the stated per-copy fee through the Copyright Clearance Center, Inc. for all copying not explicitly permitted by Sections 107 or 108 of the U.S. Copyright Law. It does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, nor to the reprinting of figures, tables, and text excerpts.

Subscription rates:

Volumes 38, 39, 40, and 41, 1980 (6 issues each) \$98.75 per volume (outside the U.S., \$111.75 per volume).

Second-class postage paid at Jamaica, N.Y. 11431.

Printed in Great Britain.

*Journal of Low Temperature Physics* is published monthly at Winterstoke Road, Bristol 3, England, by Plenum Publishing Corporation, 227 West 17th Street, New York, N.Y. 10011. In 1980, Volumes 38, 39, 40, and 41 (6 issues each) will be published. Subscription orders should be addressed to the publisher. *Journal of Low Temperature Physics* is abstracted or indexed in Applied Mechanics Reviews, Chemical Abstracts, Chemical Titles, Current Contents, Energy Research Abstracts, Engineering Index, INSPEC—Electrical and Electronics Abstracts and Physics Abstracts, Metals Abstracts Index, Referativnyi Zhurnal, Science Citation Index, Science Research Abstracts—Part A, and Solid State Abstracts Journal. © 1980 Plenum Publishing Corporation. *Journal of Low Temperature Physics* participates in the program of Copyright Clearance Center, Inc. The appearance of a code line at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of this article may be made for personal or internal use. However, this consent is given on the condition that the copier pay the stated per-copy fee through the Copyright Clearance Center, Inc. for all copying not explicitly permitted by Sections 107 or 108 of the U.S. Copyright Law. It does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, nor to the reprinting of figures, tables, and text excerpts.

# CONTENTS

Vol. 38, Nos. 1/2

January 1980

Half-Harmonic Parametric Oscillations in Josephson Junctions <i>N. F. Pedersen, O. H. Soerensen, B. Dueholm, and J. Mygind</i>	1
Ground State of Two-Dimensional Liquid $^4\text{He}$ <i>C. C. Chang</i>	25
Pulsed NMR Study of Submonolayer and Multilayer $^3\text{He}$ Films Adsorbed on Grafoil <i>Kōzō Satoh and Tadashi Sugawara</i>	37
The Heat Capacity of Uranium Monoarsenide <i>A. Blaise, R. Troć, R. Lagnier, and M. J. Mortimer</i>	79
Critical Currents of Sputtered $\text{M}_x\text{Pb}_{1-x}\text{Mo}_{6+y}\text{S}_8$ -Type Thin Films <i>Piotr Przysławski, Roman Horyń, and Beata Greń</i>	93
$^3\text{He}$ on MgO: Nuclear Magnetic Relaxation Properties <i>R. F. Buzerak and R. J. Rollefson</i>	105
Superconducting and Normal State Properties of Dilute Alloys of $\text{LaSn}_3$ Containing Nd Impurities <i>L. E. DeLong, M. Tovar, L. D. Woolf, M. B. Maple, D. C. Johnston, and J. Keller</i>	119
The Phonon Absorption Line Shape of Solid Molecular $\text{H}_2$ and $\text{D}_2$ as a Function of Density <i>Victor V. Goldman</i>	149
Thermal Conductance of Metal Interfaces at Low Temperatures <i>B. Schumann, F. Nitsche, and G. Paasch</i>	167
Superconductivity of Small Metallic Particles. I <i>Arisato Kawabata</i>	191
Pinning of Vortices in Nucleopores. Effect on Second-Sound Resonators <i>D. d'Humières, A. Launay, and A. Libchaber</i>	207
Fluctuation Conductivity in Intercalated Superconductors <i>L. G. Aslamasov and A. A. Varlamov</i>	223



Specific Heat Capacity of Molybdenum Chalcogenides. III. Measurements of the Heat Capacity of $\text{Sn}_{1-x}\text{Ga}_x\text{Mo}_5\text{S}_6$ . An Investigation of the Singularities at Low Temperatures	243
<i>N. E. Alekseevskii, G. Wolf, V. I. Tsebro, N. M. Dobrovolskii, K. Bohmhammel, and S. Krautz</i>	
Specific Heat Capacity of Molybdenum Chalcogenides. IV. An Investigation of the Heat Capacity of Binary and Halogen-Substituted Molybdenum Chalcogenides	253
<i>N. E. Alekseevskii, G. Wolf, N. M. Dobrovolskii, and C. Hohlfeld</i>	

**Vol. 38, Nos. 3/4**

**February 1980**

Phonon-Limited Mean Free Path in the Sondheimer Oscillation of Aluminum	267
<i>H. Sato</i>	
Discussion of Nonbranching Laminar Intermediate-State Structures in Superconducting Bulk Lead	277
<i>A. Kiendl</i>	
Electron Escape from the Image-Potential-Induced Surface States on Liquid Helium	293
<i>Yasuhiro Iye, Kimitoshi Kōno, Koji Kajita, and Wataru Sasaki</i>	
Normal Fluid Heat-Exchange Drag in Liquid Helium II	311
<i>Robert Lynch</i>	
Tunneling Investigation of Cu-Pb Proximity Sandwiches. Barrier Transmission Effects	315
<i>Jerry Allen Wilson and P. M. Chaikin</i>	
Phase Transitions in Two-Dimensional Electron-Hole Systems in High Magnetic Fields	333
<i>I. V. Lerner and Yu. E. Lozovik</i>	
Steady-State Flux-Line Cutting in Type II Superconductors	353
<i>John R. Clem</i>	
A Monte Carlo Study of the Rotation-Libration Transition in Solid $\text{H}_2$ Under Pressure	371
<i>I. Aviram, S. Goshen, and R. Thieberger</i>	
Flow of Helium II Through Porous Vycor Glass Under Small Pres- sure Gradients	381
<i>S. L. Chan</i>	

Energy Band Theory and the Lattice Dynamics of Rare Gas Crystals <i>J. P. Worth and S. B. Trickey</i>	393
Wannier Exciton-Ionized Donor Complexes in Thallium Halides <i>Piotr Petelenz and Vedene H. Smith, Jr.</i>	413
Electron Interference Oscillations and Spin-Density-Wave Energy Gaps at the Fermi Surface of Antiferromagnetic Chromium <i>R. Reifenberger, F. W. Holroyd, and E. Fawcett</i>	421
The Low-Frequency, Low-Temperature Dielectric Behavior of <i>n</i> -Type Germanium Below the Insulator-Metal Tran- sition <i>T. G. Castner, N. K. Lee, H. S. Tan, L. Moberly, and O. Symko</i>	447
Entropy and Magnetization Measurements Relating to the Nature of the Adsorbed Phases of Helium-3 Under Pressure <i>H. B. Mitchell, D. F. Brewer, S. J. Swithenby, and W. S. Truscott</i>	475
Charge Imbalance Waves and Nonequilibrium Dynamics Near a Superconducting Phase-Slip Center <i>A. M. Kadin, L. N. Smith, and W. J. Skocpol</i>	497
Erratum: Conductivity of Thin Metal Slabs with Rough Surfaces <i>L. A. Falkovsky</i>	535

**Vol. 38, Nos. 5/6**

**March 1980**

Surface Energy and Textural Boundary Conditions Between A and B Phases of $^3\text{He}$ <i>R. Kaul and H. Kleinert</i>	539
The Resistive Transition and Superconducting Properties of Optic- ally Illuminated Tin Microstrips <i>L. N. Smith</i>	553
Theory of Motional Inhibition of Interlayer Quantum Tunneling in Thin $^3\text{He}$ Films <i>W. J. Mullin and A. Landesman</i>	571
Relations Between Specific Heat Discontinuities and Ginzburg- Landau Parameters for Superfluid $^3\text{He}$ <i>D. Rainer and J. W. Serene</i>	601
Thermopower of Cadmium and Tungsten Single Crystals in a Magnetic Field <i>B. J. Blumenstock and P. A. Schroeder</i>	605

Coherent Diffusion of Isotopic Impurities in Solid Helium <i>T. McMullen</i>	619
Pressure Release Superleak Sound in He II <i>David Heckerman, Ralph Rosenbaum, Seth Putterman, and Gary A. Williams</i>	629
Anomalous Nuclear Spin Relaxation in Liquid $^3\text{He}$ - $^4\text{He}$ Mixtures Near the Lambda Transition <i>Tsuneo Kobayashi and Yoshimasa Narahara</i>	641
Surface Magnetism in $^3\text{He}$ : Thermodynamics <i>Pradeep Kumar</i>	655
Magnetic Field Properties of 1 at.% Transition Metal Substituted $\text{Nb}_3\text{Ge}$ <i>F. J. Cadieu and N. Chencinski</i>	667
Theory of Orbital Dynamics of the A Phase of Superfluid $^3\text{He}$ . II. Orbital Hydrodynamic Equations <i>K. Nagai</i>	677
Frequency and Temperature Dependence of Ultrasonic Attenuation in Indium in a Transverse Magnetic Field and in Zero Field <i>B. Berre and E. Bersum</i>	707
Effect of Random Distortions on the Critical Field in Layered Superconductors <i>K. B. Efetov</i>	719
Two-Stage Nuclear Demagnetization Refrigerator <i>K. Ōno, S. Kobayasi, M. Shinohara, K. Asahi, H. Ishimoto, N. Nishida, M. Imaizumi, A. Nakaizumi, J. Ray, Y. Iseki, S. Takayanagi, K. Terui, and T. Sugawara</i>	737
The Influence of Light- and Heavy-Ion Irradiation on the Structure, Resistivity, and Superconducting Transition Temperature of $\text{V}_3\text{Si}$ . A Comparative Study <i>O. Meyer and G. Linker</i>	747
Current States and Domains in Systems with Electron-Hole Pairing <i>Yu. E. Lozovik and A. V. Klyuchnik</i>	761
Resistivity Anomaly in Thin Bi Wires: Possibility of a One-Dimen- sional Quantum Size Effect <i>Michael Gurvitch</i>	777
Author Index to Volume 38	795
Subject Index to Volume 38	797